

## Claims

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- 3 1. Piezoelectric actuator having  
4 - a piezoelectric element (2; 21) for actuating a mechanical component with  
5 a pulling or pushing force, and a compensating element (3; 22), wherein  
6 the piezoelectric element (2) and the compensating element (3; 22)  
7 basically have the same temperature expansion coefficients, and wherein  
8 - the compensating element (3; 22) is mechanically coupled to the  
9 piezoelectric element (2; 21) in such a fashion that the temperature-  
10 induced expansions of the piezoelectric element (2; 21) and the  
11 compensating element (3; 22) cancel each other out in the effective  
12 direction in such a fashion that the actuating element remains in its  
13 position.
- 14
- 15 2. Piezoelectric actuator according to claim 1, characterized in that  
16 - a heat transfer compound (12) is located between the piezoelectric  
17 element (2; 21) and the compensating element (3; 22).
- 18
- 19 3. Piezoelectric actuator according to claim 1 [or 2], characterized in that  
20 - the piezoelectric element (2; 21) is supported on one end on a fixed  
21 support plate (9), which fixed support plate (9) bears against the housing  
22 (7) for the piezoelectric actuator (1; 20) via a spring (10) and which is  
23 connected at the other end to a pretensioning spring (6; 23) via a pressing  
24 plate (11; 24), which pretensioning spring (6; 23), in turn, is held against  
25 the fixed support plate (9) with its other end, and that  
26 - the compensating element (3; 22) basically lies parallel to the piezoelectric  
27 element (2; 21) and is also held against the fixed support plate (9) with  
28 one end and solidly abuts the housing (7) with the other end.
- 29
- 30 4. Piezoelectric actuator according to claim 3, characterized in that

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1 - the pretensioning spring (6) and the piezoelectric element (2) are located  
2 in tandem.  
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4 5. Piezoelectric actuator according to claim 4, characterized in that  
5 - the movable end of the piezoelectric element (2) is connected to the  
6 pressing plate (5) via a tightening strap (8).  
7

8 6. Piezoelectric actuator according to claim 3, characterized in that  
9 - the pretensioning spring (23) and the piezoelectric element (21) are  
10 situated parallel to each other.  
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12 7. Piezoelectric actuator according to [one of the preceding claims] claim 1,  
13 characterized in that  
14 - the pretensioning spring is formed out of at least one zigzag spring (6; 23).  
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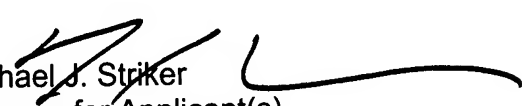
16 8. Piezoelectric actuator according to [one of the preceding claims] claim 1,  
17 characterized in that  
18 - the piezoelectric element (2; 21) is composed of a multilayer structure of  
19 transversely arranged, ceramic piezoelectric plies that become longer in  
20 the effective direction when an external electric voltage is applied, and the  
21 compensating element (3; 22) is made of ceramic.  
22

23 9. Piezoelectric actuator according to [one of the claims 1 through 6] claim 1,  
24 characterized in that  
25 - the piezoelectric element (2, 21) is composed of a multilayer structure of  
26 transversely arranged, ceramic piezoelectric plies that become longer in  
27 the effective direction when an external electric voltage is applied, and that  
28  
29 - the compensating element (3; 22) is composed of piezoelectric plies  
30 arranged in the longitudinal direction that become shorter in the effective  
31 direction when an external electric voltage is applied.

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Consideration and allowance of the present application is most respectfully requested.

Respectfully submitted,

  
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